

THE CENTER OF GRAVITY CONCEPT: A STUDY OF ITS DESCRIPTION AND APPLICATION IN TWO DIFFERENT ERAS

A Monograph

by

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ABSTRACT

THE CENTER OF GRAVITY CONCEPT: A STUDY OF ITS DESCRIPTION AND APPLICATION IN TWO DIFFERENT ERAS, by Major Shayla D. Potter, 50 pages.

The center of gravity (COG) concept is internationally recognized and a foundational pillar of military success. Given that COG remains a key concept in U.S. military doctrine, understanding the concept's use and application in both the classical and modern eras will help operational planners bring the concept forward into the future. This paper explores how Carl von Clausewitz and the modern U.S. military use and describe COGs, how they differ, and what factors influence changes to the U.S. military doctrinal version of COG. Both versions facilitate the employment of force to achieve a specific effect - defeat of the enemy's combat forces. However, Clausewitz's COG refers to a "focal point" while the U.S. version refers to "sources of strength or power." Five major factors provide insight into doctrinal changes: linguistic challenges, the evolution of the modern American way of war, clarity in definition, a preference for analytical simplicity, and theories on the evolution of ideas. Analyzing these factors provide several plausible theories to explain how and why U.S. doctrine's version of the COG is different and prepares the reader to draw his or her own conclusions regarding if the changes are a natural evolution or diverse enough to alter Clausewitz's original intent.

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ACRONYMS

ADM	Army Design Methodology
ADRP	Army Doctrine Reference Publication
COG	Center of Gravity
FM	Field Manual
IPB	Intelligence Preparation of the Battlefield
JP	Joint Publication
PMESII	Political, Military, Economic, Security, Information, Infrastructure
SOP	Standard Operating Procedure

INTRODUCTION

Military concepts typically reflect contemporary situations. In other words, a military concept's relevancy depends on its current utility. As military concepts become outdated or ineffective to the military practitioner, revisions become necessary. The more time passes and revisions made, the further a concept can stray from its original context. This study further examines the natural progression of the military concept, *center of gravity*, to answer the research question: How has modern U.S. military doctrine changed the concept of COG from Clausewitz's version?

This paper demonstrates that insight into how and why changes in U.S. doctrine are constructive in understanding the COG debates — the concept's relevancy and meaning in the 21st century. This is achieved by examining how Clausewitz and the modern U.S. military use and describe COG, how they differ, and what factors influence the changes to the U.S. military's version. Historical context helps demonstrate how Clausewitz described and used the concept in the Napoleonic era, and then compares this era to the modern (i.e., late 20th and 21st century) operating environment. Furthermore, the paper generates discussion on the factors that continue to impact the description and application of COG in current and future U.S. military doctrine.

One hypothesis is that the modern U.S. military modifies the definition and application of COG to better reflect the American strategies and methods of war in the 21st century. The adoption of COG solved a problem in the 19th century that is still relevant today: how to strike and effectively destroy enemy combat forces and achieve strategic victory. COG illustrates both the concept of concentration and the principle of mass in war. In *On War*, Carl von Clausewitz, a classical military theorist, uses the concept to clarify his position on massing combat power to

effectively strike at the enemy's central core of strength among its armed forces.¹ His use of the concept is more conceptual than detailed to account for all the exceptions and caveats in war. The U.S. military expands Clausewitz's concept, developing an analytical construct for detailed analysis and planning.²

A comprehensive answer to the research question requires the study to address a few considerations. These considerations provide context for the argument that the way the United States uses and applies the COG concept is different from Clausewitz. First, the U.S. version reflects modern American warfare in the 21st century. Also, the impact measures doctrine, military organization, and technological changes. This is similar to Clausewitz's notion that each era has its own theory and type of war, which is why concepts reflect the respective operating environment.³ In *On War*, Clausewitz asserts that physically massing large formations in one area to deliver a debilitating blow against the core of the enemy's land forces is the key to the destruction of the opponent. This is consistent with 18th and early 19th century warfare. The U.S. military modifies the concept of concentration and the principle of mass which achieves greater success on the modern battlefield. Today, in response to advances in missile and aircraft technology, the U.S. military emphasizes capability to achieve a desired effect. The U.S. military conducts offensive and defensive operations to neutralize, defeat, or destroy the enemy by massing the effects of its combat power that is arrayed across multiple geophysical areas, rather

¹Carl von Clausewitz, *On War*, eds. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1989), 485-486.

²Headquarters, Department of the Army (HQDA), Army Doctrinal Reference Publication (ADRP) 3-0, *Unified Land Operations* (Washington, DC: Government Printing Office, 2011), III-23.

³Clausewitz, 593.

than the traditional method of physically massing large formations on the battlefield.⁴ The stealth, speed, and lethality of military technology, along with an increasingly adaptive, dispersed, and networked enemy, makes physically massing modern forces on the battlefield too costly and risky. Joint Publication (JP) 3-0, *Joint Operations* (2011), defines the principle of mass: “[m]assing effects of combat power, rather than concentrating forces, can enable even numerically inferior forces to produce decisive results and minimize human losses and waste of resources.”⁵ Though there are clear differences, the aim is still the same. Clausewitz and U.S. military doctrine both focus on destroying the enemy's military power and their ability to accomplish military objectives. This is the most straightforward approach to strategic victory. This study also explores the relationship between the principle of concentration and the application of COG.

Second, modern technological advances (e.g., precision-guided bombers, unmanned aerial platforms, and global intelligence sensors), economic and political factors change the way the U.S. military conducts war and employs its forces. Since the Napoleonic period, there have been at least five major revolutions in military affairs (RMA) which include fundamental changes in military doctrine, military organizations, and military technology.⁶ The Murray-Knox argument regarding each RMA adds context regarding the factors leading to changes in the U.S. military's definition of COG.

⁴HQDA, Joint Publication (JP) 3-0, *Joint Operations* (Washington, DC: Government Printing Office, 2011), A-2.

⁵HQDA, JP 3-0, A-2.

⁶Murray and Knox, 176-179. Murray and Knox present five historical military revolutions: the 17th century modern nation-state construct; the 18th century French Revolution; the late 18th century through 19th century Industrial Revolution; the First World War; and the Nuclear/Cold War era. Some, like Antoine Bousquet in *The Scientific Way of Warfare: Order and Chaos On the Battlefields of Modernity* and Vice Admiral Arthur K. Cebrowski, USN and John Garstka in “Network-Centric Warfare - Its Origin and Future,” discuss that 21st century warfare is characterized as network or information warfare.

This paper uses several key terms and concepts and defining those terms ensures a common understanding. Principal strength refers to the opponent's main combat forces. Modern U.S. military doctrine refers to the following doctrine after 1986: Field Manual (FM) 100-5, *Operations* (1986/1993); FM 3-0, *Operations* (2008); Army Doctrine Reference Publication (ADRP) 3-0, *Unified Land Operations* (2012); and JP 5-0, *Joint Operations* (2011). Finally, the term enemy system includes the following subcomponents: the political base, the industrial base, the support base, the public relations or information base, the weapons and technology production base, etc.⁷

To address the research question, this paper independently examines, in Sections 1 and 2 respectively, how Clausewitz originally defines and uses the term taking into account how the principle of concentration and Strange's model form the principle of mass and the perspective of modern U.S. military doctrine. Section 3 compares and contrasts the previous two sections and discusses how modern U.S. military doctrine reinterprets the concept.⁸ The final section analyzes the factors influencing U.S. military doctrine's changes and expands on the reasons for these changes.⁹

SECTION ONE: CARL VON CLAUSEWITZ'S VERSION OF "CENTER OF GRAVITY"

⁷Antulio J. Echevarria, *Clausewitz's Center of Gravity Changing Our Warfighting Doctrine - Again!* (Carlisle, PA: Army War College, Strategic Studies Institute Press, 2002), 12.

⁸Research in this section looks at a number of contemporary writings of military historians, such as Joseph L. Strange and Richard Iron, "Understanding Centers of Gravity and Critical Vulnerabilities, Part 2," The Air University, www.au.af.mil/au/awc/awcgate/usmc/cog1.pdf pp.1 (accessed 31 October 2013); and Echevarria.

⁹Research in this section incorporates contemporary authors on factors affecting change in U.S. military doctrine. These authors include Bousquet in *The Scientific Way of Warfare*, and Alan Beyerchen, "Clausewitz, Nonlinearity and the Unpredictability of War," *International Security* 17, no. 3 (Winter 1992).

In *On War*, Carl von Clausewitz uses COG to facilitate the employment of force in an annihilation strategy for limited and unlimited wars. To achieve the object of war—the preservation of your forces and the complete destruction of the enemy’s forces—his concept allows the commander to do three things: impose his will on the enemy, use the maximum available force, and render the enemy into a powerless state where fighting no longer remains a viable strategy.¹⁰ Clausewitz’s COG provides a mental model to help military commanders understand and conceptualize where to strike an opponent’s forces during the decisive battle and achieve a specific effect -- the complete destruction of the opponent’s military forces.

This section discusses how Clausewitz originally described and applied his version of COG. First, it defines COG, and then explores Clausewitz’s use of the concept: as a figurative expression to illustrate and describe the nature and important aspects of COG; and to illustrate the functionality and behavior to help commanders identify COG, focus combat efforts, and design an effective strategy to destroy the opponent’s military power.

Clausewitz defines COG as “the hub of all power and movement, on which everything depends. That is the point which all our energies should be directed.”¹¹ This illustrates three important aspects of a COG: what it is, where and when it exists, and how it behaves. Carl von Clausewitz likens a COG to “a focal point.” His point is to convey that a COG has a cohesive element that allows the opponent, and the totality of the parts that form its force, to act as a single body. In “Clausewitz’s Center of Gravity Changing our Warfighting Doctrine - Again!,” Dr. Echevarria describes “focal points” as serving a specific purpose: giving the enemy purpose and

¹⁰Clausewitz, 642.

¹¹Ibid., 595-596.

direction and drawing and organizing power from a variety of sources, such as a population base, industrial base, or production base.¹² These sources also make up the enemy system.

Clausewitz also writes that a COG is “the most effective target for a blow.” This represents a target area, the destruction of which leads to a marked advantage over one’s opponent. He says this is the point where one must focus efforts in order to defeat the enemy. In addition to striking the opponents’ COG, one must ensure the protection of friendly COGs as the enemy has the same strategy. Survivability on the battlefield is contingent upon protecting one’s own COG while destroying the enemy’s.¹³ Additionally, Clausewitz also mentions “the heaviest blow.” This refers to the effects of combat power applied to any system. Defeating the enemy requires overwhelming force or “blows” to be delivered in successive fashion, knocking the opponent off balance and preventing recovery.¹⁴

To illustrate where and when COGs exist, Clausewitz refers to the “area where the mass is concentrated most densely”¹⁵ and to “the cohesion of parts,” which is a factor that must be present to successfully apply Clausewitz’s COG.¹⁶ According to Clausewitz, the enemy’s armed forces must have a certain unity and cohesion for the “analogy of the center of gravity to be applied.”¹⁷

¹²Echevarria, 12.

¹³Clausewitz, 488-490.

¹⁴Ibid., 596.

¹⁵Ibid., 486.

¹⁶Ibid., 485-486.

¹⁷Ibid., 485-486.

To illustrate how COGs behave, Clausewitz discusses “the active agent.”¹⁸ COGs are active agents or drivers of action; to effectively change their behavior, there is a need for identification of the focal point of the enemy’s structure to “knock it off balance.”¹⁹ Clausewitz writes that the “true” COG acts as an “active agent” or entity that possesses the capability, influence, or authority to lead, direct, and govern the entire enemy system in achieving its nation’s political objectives.²⁰ Active agents also refer to troop formations, groups, or individuals.²¹ To put the definition in context, Clausewitz uses mental models to facilitate understanding of COGs; particularly, he was most interested in their nature and effects.

Clausewitz uses COG as a mental model to facilitate a clearer understanding of the nature and effects of the enemy’s “focal point.” First, mental models give commanders the means to visualize and determine the enemy’s most critical point on the battlefield in order to destroy it. Mental models are “[b]eliefs, ideas, images, and verbal descriptions that we consciously or unconsciously form from our experiences and which (when formed) guide our thoughts and actions.”²² The use of mental models helps in understanding the external world. The use of mental models in scientific thinking is characteristic of 19th century physics, as with Ludwig Boltzmann, who argues that ideas and concepts are only internal pictures: “The task of theory consists in constructing an image of the external world that exists purely internally and must be our guiding star in thought and experiment; that is in completing, as it were, the thinking process and carrying

¹⁸Ibid., 488.

¹⁹Ibid., 596.

²⁰Ibid., 486.

²¹Joseph L. Strange and Richard Iron, “Center of Gravity: What Clausewitz Really Meant,” *Joint Forces Quarterly* 35 (2004): 27.

²²BusinessDictionary.com, “Mental Models,” WebFinance Inc., www.businessdictionary.com/definition/mental-models.html#ixzz2hFVIQdBe (accessed 9 October 2013).

out globally what on a small scale occurs within us whenever we form an idea.”²³ Since developing mental models is a common practice in theory development in the 19th century, one can infer that Clausewitz follows this practice in writing *On War*. Clausewitz’s preference for analogies when referring to COGs helps communicate how they exist and function in war.²⁴ Clausewitz uses analogies, a form of mental model, to illustrate abstract ideas. Analogies help convey the significance of defeating the enemy and achieving military objectives. He uses analogies to relay complexity and animate interactions between opposing forces, using expressions such as “a duel,” “wrestling,” “concave mirror,” or “balance.” These analogies help practitioners to conceptualize COGs in war. COG allows Clausewitz to illustrate his main point: war is a competition between two opposing forces that want to impose their will on the enemy. He describes this phenomenon as it relates to COGs as “collisions between two living forces.”²⁵ COG has a dynamic component to it, as it interacts with external forces. As with a wrestler, COG shifts as one force aims to displace the other, throwing it off balance. His analogy of a concave mirror stresses how all sources converge at a single “focal point,” which is a combination of each contributing source of power.²⁶ From the physical, land-domain point of view, the enemy’s equilibrium or balance lies in its armed forces. Attacking these forces would, in theory, result in the complete destruction of the opponent’s forces, leading to the optimal result: complete surrender.

²³Phil N. Johnson-Laird, “The History of Mental Models,” in *Psychology of Reasoning: Theoretical and Historical Perspectives*, eds. K. Manktelow and M. C. Chung (New York, NY: Psychology Press, 2004), 179-212.

²⁴Clausewitz, 485-486.

²⁵Clausewitz also makes reference to “collision between centers of gravity” in the context of a major battle in a theater of operations in Chapter 28. Clausewitz, 77.

²⁶Clausewitz, 258.

Clausewitz uses COG to facilitate understanding of the enemy system's functionality and behavior in war. Clausewitz adopts Newton's scientific COG which shares similar characteristics of the military COG—the phenomena of balance, equilibrium, and mass within an object or entity. Newton's law defines COG: "A center of gravity represents the point where the forces of gravity converge within an object. At that point an object's weight is balanced in all directions."²⁷ Newton is referring to the state of an object where it is most stable and balanced. Transferring this concept into a military context, Clausewitz's COG refers to the full weight of an enemy's force.²⁸ Weight, in this sense, refers to the preponderance of a belligerent's combat power in pursuit of their military and political aims. Dr. Milan Vego, a respected military historian, supports this notion and offers that Clausewitz's COG refers to the enemy's "weight (or focus) of effort" which is comprised of the highest distribution of combat forces arrayed on the battlefield.²⁹ Deductions from Vego's argument include Clausewitz's COG is more about a factor of balance and the enemy's weight of effort. A decisive effect results from creating an imbalance of combat power between opposing forces. This is demonstrated by a commander overmatching an opponent's combat strength, thereby, overwhelming the enemy to the point of culmination.

The first similarity with Newton's law is that interdependent forces exist within a physical object. Clausewitz relates this idea of "interdependency" to "connections among the

²⁷Geoff Jones, Mary Jones, and Phillip Marchington, *Cambridge Coordinated Science: Physics* (Cambridge, MA: Cambridge University Press, 1993): 52-55.

²⁸In contrast, the Paret's English translation (1986) of Clausewitz's *On War* translates this word as meaning "source." From this translation, U.S. doctrine describes COGs as a source of strength. Echevarria explains that Clausewitz never used the term "source" which is the German word "*Quelle*." Again, using the *Vom Kriege* translated version, the words Clausewitz used were "*Gewicht*" and "*Macht*." This roughly translates to the full weight (*Gewicht*) of the enemy's force (*Macht*). This is in accord with the Newtonian COG concept. Echevarria, 9.

²⁹Milan Vego, "Clausewitz's Schwerpunkt Misunderstood: Mistranslated in German – Misunderstood in English," *Military Review* (2007): 103.

various parts of an adversary, or adversaries, to determine what holds them together.”³⁰

Clausewitz states that “a center of gravity is determined and limited by the cohesion of the parts.”³¹ He also says, “Where there is cohesion, the analogy of the center of gravity can be applied.”³² Dr. Echevarria writes “COGs are found only where sufficient connectivity exists among the various parts of the enemy to form an overarching system (or structure) that acts with a certain unity, like a physical body.”³³ This interdependency helps the enemy to act as a single unified body, so there is a unity of effort and coordination between elements of the system. To illustrate this point, Clausewitz writes that “[s]mall things always depend on great ones, unimportant on important, accidentals on essentials. This must guide our approach.”³⁴ Any effect on the enemy COG affects the system as a whole. Therefore, defeating the enemy system is a consequence of many interrelated factors.

Clausewitz and Newton’s COGs mirror each other in their emphasis that COGs possess a “force” that holds the entire system together and functions as a single unit.³⁵ Dr. Echevarria compares “focal point” to a centrifugal force that holds the system together and gives it focus and direction. Clausewitz’s COG serves “as a focal point that draws and organizes power from a variety of sources: a population base (recruits); an industrial base (weapons and materiel); and an agricultural base (foodstuffs). The same held true for the personalities of key leaders, state

³⁰Ibid., 10.

³¹Clausewitz, 485-486.

³²Ibid., 486.

³³Echevarria, 16.

³⁴Clausewitz, 596.

³⁵Clausewitz, 11.

capitals, or alliance networks. These “focal points” drew raw power from different sources and refine, organize, and redirect it.”³⁶

The final connection to Newton’s scientific concept deals with the effect of an object’s COG. According to Newton, if an object moves such that its COG shifts from the point of equilibrium, the object falls over, thus losing balance.³⁷ Clausewitz’s concept adopts this understanding and argues that if we effectively strike the enemy’s COG, the effect, much like Newton’s COG law, collapses the system, rendering it incapable of fighting.³⁸ Successive force directs at the “focal point” within the enemy’s system.³⁹ Clausewitz speaks about the “focal point” in the following quote:

What theory can admit to thus far is the following: Everything depends upon keeping the dominant characteristics of both states in mind. From these emerge a certain center of gravity, a focal point (*Zentrum*) of force and movement, upon which the larger whole depends; and, it is against the enemy’s center of gravity that the collective blow of all power must be directed.⁴⁰

Clausewitz’s COG helps the commander to employ and concentrate his combat forces at the decisive point of the main battle. The implications of effects on the enemy’s COG guides how a commander should best array his combat firepower to produce the most decisive effect on the enemy’s system. Clausewitz learned the most effective practices in striking the enemy through personal observation and study of wars during the Napoleonic period. One lesson he draws is the principle of mass, and how a commander employs this technique determines the defeat of the opponent’s armed forces. Clausewitz believes commanders should physically mass their combat

³⁶Echevarria, 12.

³⁷Ibid., 8.

³⁸Clausewitz, 596.

³⁹Ibid.

⁴⁰This is the *Vom Kriege* translation from Echevarria, 11.

forces to destroy the enemy. He also states that “[t]he best strategy is always *to be very strong*; first in general, and then at the decisive point . . . there is no higher and simpler law of strategy than that of *keeping one’s force concentrated*. No force should ever be detached from the main body unless the need is definite and *urgent*. We hold fast to this principle, and regard it as a reliable guide.”⁴¹ Striking the enemy’s COG requires a force to mass combat power at the decisive point during the main battle to generate the greatest effect and destroy the enemy. The greatest effect requires dealing a “blow” multiple times. Clausewitz states that “the force at which our blow is to be aimed requires that our strength be concentrated to the utmost.”⁴² He also states that “the larger the force with which the blow is struck, the surer its effect will be.”⁴³

Furthermore, Clausewitz’s COG facilitates the design of an effective strategy to destroy the opponent’s armed forces. Clausewitz’s COG provides a conceptualized method to plan and assess which effects to apply to the entire enemy system to achieve victory. COG assists the practitioner in determining how the enemy’s forces may operate throughout the campaign.⁴⁴ Clausewitz believes that COG is essential to planning. Therefore it should be the first task in campaign planning. According to Clausewitz, the first task “is to identify the enemy’s COGs, and if possible trace them back to a single one.”⁴⁵ Clausewitz believes that striking the opponent’s COG was the best way to begin achieving the object of war that “[n]o matter what central feature of the enemy’s power may be . . . the defeat and destruction of his fighting force remains the best

⁴¹It should be noted that Clausewitz acknowledges a caveat with the strategy of principles of concentration as applied to every kind of war. He states, “We shall also learn that the principle of concentration will not have the same results in every war, but that those will change in accordance with means and ends.” Clausewitz, 204.

⁴²Clausewitz, 485.

⁴³Ibid.

⁴⁴Ibid., 486.

⁴⁵Clausewitz, 617.

way to begin.”⁴⁶ Clausewitz understands COGs to be self-evident in identifying physical forces (e.g., armies, leadership) and less evident in discerning relevant psychological forces (e.g., will, morale).⁴⁷ However, judgment is a major factor in planning when and where to strike these “central features of an enemy’s power.”⁴⁸ This facilitates the second task—the execution of the plan—to defeat the enemy. For Clausewitz, the practitioner who identifies the enemy’s COG will have a more effective plan of action.

Identifying the enemy’s COG is one of the most important tasks in campaign planning. Striking the opponent’s COG provides the most straightforward means to deny the enemy’s ability in achieving his military objectives and, Clausewitz mentions, is not a conclusive factor. Clausewitz states that striking the enemy’s COG sets the conditions for victory.⁴⁹ He signifies that defeating the enemy, through its COG, is the surest path. However, he warns that there are still other factors at play, and to have lasting effects on the enemy, one must impact the entire system. There are countless other factors, such as chance and friction, which affect a commander’s momentum and ability to gain an advantage over his opponent. Clausewitz acknowledges this and writes, “It may not be the only decision to victory but it is the first, and as

⁴⁶Ibid., 596.

⁴⁷Strange and Iron, “Understanding Centers of Gravity and Critical Vulnerabilities, Part 2,” 15. Dr. Strange states, “Physical centers of gravity tend to be easy to visualize -- armies or units, things that resist an opponent. Moral centers of gravity are intangible, and therefore less easy to grasp.”

⁴⁸Clausewitz states, “It is therefore a major act of strategic judgment to distinguish these centers of gravity in the enemy’s forces and to identify their spheres of effectiveness. One will constantly be called upon to estimate the effect that an advance or a retreat by part of the forces on either side will have upon the rest.” Clausewitz, 486.

⁴⁹Clausewitz states, “... by constantly seeking out the center of his [the enemy] power, by daring all to win all, will one really defeat the enemy ... the defeat and destruction of his [the enemy’s] fighting forces remains the best way to begin, and in every case will be a very significant feature of the [military] campaign.” Clausewitz, 596.

such will affect all those that follow.”⁵⁰ Striking the COG is an intermediate objective, establishing the conditions for the ultimate aim—strategic victory. In Book 8 of *On War*, Clausewitz says striking the enemy, in theory, is the most effective and straightforward means to achieve one’s political and military aim. In practice, destruction of the enemy COG may not result in immediate victory. He emphasizes the interdependent relationships within the enemy system, and not all enemy systems are apt to succumb under pressure. Thus, striking the enemy’s COG may not guarantee a decisive victory. One needs to be prepared to undertake successive strikes and target the psychological or moral elements of the enemy COG. Clausewitz emphasizes this in his book: “The decision brought about by a great battle does not depend entirely on the battle itself (i.e., scale of the forces engaged and intensity of the victory).

In summary, Clausewitz’s COG helps practitioners to identify and attack the enemy’s main concentration of forces during the decisive battle. He uses and describes COG and how he intends practitioners to understand and apply it as a mental model. He develops the concept as a means to help commanders defeat the enemy and to achieve one’s military end state through designing an effective campaign plan. Clausewitz’s COG is mostly a figurative expression or analogy to conceptualize and describe how the enemy’s most critical forces behave— leading, directing, and governing actions across the span of the enemy’s armed forces. Clausewitz’s use of COG is to illustrate the enemy’s main fighting body, which if struck, would render the enemy incapable of fighting. A discussion of how the U.S. military defines and uses COG in the modern era follows.

⁵⁰Clausewitz, 260-261.

SECTION TWO: THE VERSION OF “CENTER OF GRAVITY” IN U.S. MILITARY DOCTRINE

Modern U.S. military doctrine uses COG to facilitate the employment of force in both attrition and an annihilation (psychological) military strategy to defeat the enemy’s armed forces, networks, and organizations and prevent the enemy from achieving their military objectives. As this statement implies, the use of the COG concept has expanded, but this section explains how the U.S. COG concept still relies on the Clausewitzian version although with some adaptations. Modern U.S. military doctrine now provides a more practical model to help operational planners determine and develop effective strategies that aim to defeat modern adversaries’ capabilities and “sources of strength,” enabling them to achieve their military objectives.

This section discusses how modern U.S. military doctrine defines COGs, the principle of concentration and how it relates to striking the enemy, the concept’s use as an analytical construct, and its use as a planning tool to effectively develop campaign plans with the aim of defeating the enemy’s armed forces, networks, and organizations. It is important to discuss how U.S. doctrine defines COGs to understand how the U.S. military interprets Clausewitz’s original concept. This interpretation also provides context for why the U.S. military adopts the COG construct (i.e., the Strange model) which provides military planners with a practical and iterative tool to use when planning and designing campaigns.

The U.S. doctrinal definition of COG emphasizes the physical strengths and capabilities of friendly and enemy military forces. U.S. doctrine explains that the most effective means to defeat the enemy is destroying its military capabilities and its principal strength by exploiting its vulnerabilities.⁵¹ JP 5-00.1, *Joint Doctrine for Campaign Planning*, expands this point, stating that COGs consist of “those aspects of the adversary’s overall capability that, theoretically, if

⁵¹Joint U.S. Department of Defense, *Joint Publication 5-0: Joint Operation Planning*, (Washington, DC: August 2011), III-24 to III-31.

attacked and neutralized or destroyed will lead either to the adversary's inevitable defeat or force opponents to abandon aims or change behavior."⁵²It also includes breaking the enemy's will to fight.⁵³ This verbiage focuses on active, physical, and spatial means of combat power. However, it also mentions intangible forces (i.e., moral and psychological) as representative of COGs too. This remains within the overarching doctrinal framework, which is to "seek to throw enemy forces off balance, overwhelm their capabilities, disrupt their defenses, and ensure their defeat or destruction by synchronizing and applying all the elements of combat power."⁵⁴ These factors provide context on why the U.S. military interprets Clausewitz's COG as "sources of strength or power."

Over the years, U.S. doctrine has revised its definition of COG, yet some variant of "strength" remains in the definition. Various versions of doctrine refer to COG as a "source of strength or balance" and "the concentration of superior combat power." The 1986 version of FM 100-5 defines a COG as "that characteristic, capability, or locality from which the force derives its freedom of action, physical strength, or will to fight."⁵⁵ This version also describes COG as a "hub of all power and movement," "source of strength," and the "main source of power."⁵⁶ The 1993 version of FM 100-5 defines a COG as "the hub of all power and movement upon which everything depends; that characteristic, capability, or location from which enemy and friendly

⁵²HQDA, JP 5-00.1, *Joint Doctrine for Campaign Planning* (Washington, DC: Government Printing Office, 2002), ix.

⁵³Headquarters Department of the Army, Army Doctrinal Reference Publication (ADRP) 3-0, *Unified Land Operations*, (Washington, DC: Government Printing Office, 2012), 2-9.

⁵⁴Headquarters Department of the Army, Field Manual (FM) 3-0, *Operations* (Washington, DC: Government Printing Office, 2008), 3-8.

⁵⁵Headquarters Department of the Army, FM 100-5, *Operations* (Washington, DC: Government Printing Office, 1986), 179.

⁵⁶Headquarters Department of the Army, FM 100-5, *Operations* (Washington, DC: Government Printing Office, 1993), 6-7.

forces derive their freedom of action, physical strength, or the will to fight.”⁵⁷ The 2001 version of FM 3-0 defines COGs as “those characteristics, capabilities, or localities from which a military force derives its freedom of action, physical strength, or will to fight.”⁵⁸ This version also refers to COGs as “sources of strengths” and “the sources of power.” The 2008 version of FM 3-0 defines COGs as “the source of power that provides moral or physical strength, freedom of action, or will to act.”⁵⁹ The U.S. military determines that the phrase “the hub of movement” is too abstract for practical utility in the modern environment and, instead, replaces it with “source of power.”⁶⁰ From the Army’s perspective, the source of power refers specifically to military power, which is most often a capability in the land domain. Finally, in the 2011 version of JP 5-0, COGs are “moral or physical strengths,” “capabilities,” or “sources of strengths.”⁶¹ Joint doctrine defines COG as “a source of power that provides moral or physical strength, freedom of action, or will to act.”⁶² From the joint perspective, a source of power refers to one of the national instruments of power (i.e., military, diplomatic, information, or economic) which can be within several domains, such as land, air, sea, space, or cyber.

U.S. doctrine’s interpretation of Clausewitz’s concept as “the enemy’s strength” derives from Clausewitz’s statement on the enemy’s “hub of all power and movement,” which is the

⁵⁷FM 100-5 (1993), 6-7.

⁵⁸Headquarters Department of the Army, Field Manual (FM) 3-0, *Operations* (Washington, DC: Government Printing Office, 2001), 5-7.

⁵⁹FM 3-0 (2008), 7-6.

⁶⁰Jack Kem, *Planning for Action: Campaign Concepts and Tools* (Fort Leavenworth, KS: U.S. Army Combined Arms Center, 2012), 118.

⁶¹JP 5-0, III-22.

⁶²*Ibid.*

point where the concentration of effects should be directed.⁶³ The basis of this is Howard and Paret's translation, as discussed in section 1.⁶⁴ U.S. doctrine focuses on the physical attributes of the Clausewitzian concept, expressing COG in terms of “sources of strength” or “critical capabilities.” In their article “Centers of Gravity from the ‘Inside Out’,” Jan Rueschoff and Jonathan Dunne observe that “while COG may seem amorphous, capabilities are much more concrete and discernible.”⁶⁵ For effective action on the correct COGs, identifying the enemy’s “strength” means identifying its critical capabilities, the components or “connective tissue” within the enemy’s system that provides purpose and direction, physical strength, or the will to fight.⁶⁶

The modern adversary affects the way U.S. military doctrine defines and applies COGs on the modern battlefield. The 21st century adversary is more dynamically adaptive and networked while being globally dispersed.⁶⁷ Additionally, the COG definition in ADRP 3-0 best reflects the modern operating environment and adversarial elements.⁶⁸ Consequentially, the U.S. military adaptation in its operational approaches and employment of force to strike the opponent’s COG differs from previous eras.

⁶³Clausewitz, 596.

⁶⁴Echevarria, 9.

⁶⁵Jan L. Rueschhoff and Jonathan P. Dunne, “Centers of Gravity from the ‘Inside Out’,” *Joint Force Quarterly* 60 (2011): 121.

⁶⁶*Ibid.*, 120.

⁶⁷Antoine J. Bousquet, *The Scientific Way of Warfare: Order and Chaos On the Battlefields of Modernity* (New York, NY: Columbia University Press, 2010), 1-3. For more information on network-centric concepts and framework, see JP 3-0, appendix F.

⁶⁸ADRP 3-0, 4-3 to 4-4. ADRP 3-0 states, “A center of gravity is the source of power that provides moral or physical strength, freedom of action, or will to act (JP 5-0). This definition states in modern terms the classic description offered by Clausewitz: ‘the hub of all power and movement, on which everything depends’. The loss of a COG can ultimately result in defeat. The COG is a vital analytical tool for planning operations. It provides a focal point, identifying sources of strength and weakness.”

Today, COG facilitates the application of force. The concept relates to massing the effects of combat power to defeat the enemy and strike at the “critical capabilities” that give power to the enemy’s COG. This gives U.S. military commanders an effective and efficient way to strike the opponent while minimizing vulnerabilities to friendly forces on the modern battlefield. JP 3-0 states, “The purpose of mass is to concentrate the effects of combat power at the most advantageous place and time to produce decisive results.”⁶⁹ It then states, “Massing effects of combat power, rather than concentrating forces, can enable even numerically inferior forces to produce decisive results and minimize human losses and waste of resources.”⁷⁰ Striking the enemy’s COG, in the modern operating environment, requires massing these effects (i.e., protection, intelligence, fires, maneuver, air, and mission command) at a decisive point and time that provides a marked advantage over the enemy.

The U.S. military operationalizes COG and adapts Clausewitz’s abstract idea into a practical analytical construct. COG, in U.S. military doctrine, is an analytical construct that gives a semi-structured process, which helps break the concept into sub-elements. In 1996, Dr. Joseph Strange, a Marine Corps War College professor, developed the analytical tool, later adopted and integrated into U.S. military doctrine. The Strange model allows planners to effectively and efficiently affect enemy COGs. The model’s purpose is “to analyze existing and potential vulnerabilities of a center of gravity, and determine which of those could be especially critical.”⁷¹ The Strange model helps the planner analyze how the enemy fights and determine the critical requirements, critical vulnerabilities, and critical capabilities that validate the enemy’s COG.⁷²

⁶⁹JP 3-0, A-2.

⁷⁰Ibid.

⁷¹Strange and Iron, “Understanding Centers of Gravity and Critical Vulnerabilities, Part 2.”

⁷²JP 5-0, III-24 to III-25.

The model supports the notion that “exploiting a critical vulnerability, forces can deny a critical requirement necessary for an enemy’s critical capabilities. As the critical capabilities are degraded or denied, the enemy’s COG is also degraded or denied, eventually leading to the demise of the entire enemy system.”⁷³ The Strange model focuses on identifying the linkage between COGs and their critical vulnerabilities. It relies on a pre-determined COG and helps planners select critical factors that are distinguishable and targetable.

The Strange model attempts to operationalize Clausewitz’s original concept as a simpler process during planning. The model’s top-down approach helps practitioners to use a logical process to reaffirm the enemy’s COG and break down key sub-elements of the enemy system to understand where they should focus tactical actions to defeat the enemy.⁷⁴ Mostly objective and iterative, the process still relies on some subjectivity in determining the correct COG. The model is reductionist, as it breaks down pre-determined COGs according to three concepts: critical capabilities, critical requirements, and critical vulnerabilities. This simplifies a broad, abstract concept into a relatively non-complex analytical process.

The Strange model supports the doctrinal framework of ADRP 3-0. COGs align with the enemy’s “capabilities” rather than “a focal point.” The Strange model is a good fit within ADRP 3-0’s doctrinal framework. ADRP 3-0 emphasizes the importance of striking the enemy’s capability: its physical strengths or vulnerabilities. The U.S. military analyzes and plans actions based on capabilities and vulnerabilities. The COG construct facilitates targeting of the identified critical capabilities and critical vulnerabilities within the enemy system.⁷⁵

⁷³Joseph L. Strange, *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So We Can All Speak the Same Language*, Perspectives on Warfighting Number Four, 2nd ed. (Quantico, VA: Marine Corps Association, 1996), 3.

⁷⁴Jonas Andersson, *Center of Gravity Analysis - an Actual or Perceived Problem?* (Stockholm, Sweden: Swedish National Defense College, 2009), 47-48.

⁷⁵Kem, 179.

The COG construct is also a planning tool for framing the operational environment, providing a basis for an operational approach. It is an essential tool in the planning process. U.S. doctrine describes COG analysis as “one of the most important tasks in the operational design process.”⁷⁶ COGs are useful in developing the operational approach and are fundamental to the planning and design process.⁷⁷ COGs are relevant to framing the problem and the operational environment, while also developing and refining the commander’s operational approach.⁷⁸ COG is a part of several planning methodologies and acts as a complementary analytical tool during the planning and design process. The Army Design Methodology and Military Decision-Making Process planning methodologies identify the importance of COG within their framework. Additionally, COG is a part of the IPB, PMESII-PT,⁷⁹ and the Strange model frameworks and helps the operational planner frame and describe the operational environment, including adversarial systems.

The COG construct helps the planner determine the desired effects on the enemy or adversarial system leading to its demise: “one purpose for determining the COG is to discern where the real power is and where a knockout blow, or at least bring the enemy to a culminating point where he ceases to be effective.”⁸⁰ After properly identifying a COG, the Strange model

⁷⁶JP 5-0, III-22.

⁷⁷Ibid., III-18.

⁷⁸Ibid.

⁷⁹Doctrine states “Operational variables are those aspects of an operational environment, both military and nonmilitary, that may differ from one operational area to another and affect operations. Army planners analyze an operational environment in terms of eight interrelated operational variables: political, military, economic, social, information, infrastructure, physical environment, and time (PMESII-PT).” ADRP 3-0, 1-2.

⁸⁰Kem, 121.

assists planners in determining how best to strike the enemy's "true" COG. Planners can apply direct and indirect approaches to target the center of the enemy's COG.⁸¹

Given these points, U.S. doctrine goes beyond Clausewitz's analogous use of the COG concept. Doctrine gives a practical approach to applying the concept in a modern context. Its purpose, similar to Clausewitz's, is to guide the practitioner in analyzing the enemy to determine the most expedient and effective approach to defeat the enemy's "sources of strength;" however, the U.S. version provides a hands-on framework that guides critical thinking while also simplifying the analytical process during the planning stages of war. Concepts and tools, such as the COG construct support these approaches. The COG construct (i.e., the Strange model) assists the practitioner in applying in practice what in theory produces reliable and effective campaign plans. To achieve this aim, U.S. military doctrine uses a reductionist method, which is to generate an understanding of war and its elements by breaking down its components. This leads to an analytical framework that breaks the campaign planning process into manageable parts, of which identifying the COG is the most important step.

SECTION THREE: COMPARISON OF THE "CENTER OF GRAVITY" CONCEPT IN MODERN U.S. MILITARY DOCTRINE AND CLAUSEWITZ'S *ON WAR*

Clausewitz's theory and modern U.S. military doctrine have different purposes. Clausewitz's *On War* begins by looking at the nature of both the whole and its parts.⁸² Clausewitz's theory aims to gain a deeper understanding of the enemy's structural connectivity to understand how best to affect the system as an entire entity. The U.S. military focuses on using this COG knowledge and applying the concept in practice. The U.S. military believes that COG continues to have practical value. This is why the concept remains an essential element in

⁸¹ADRP 3-0, 4-4.

⁸²Clausewitz, 75.

planning and analysis since the 1986 version of U.S. military doctrine. The differences in the U.S. version of the COG concept reflect the evolving trend in U.S. military doctrine towards a more specific, practical, and objective concept that facilitates better application and use in the 21st century operating environment. While modern U.S. military doctrine's interpretation is different from the original Clausewitzian concept, the spirit of the original remains a focal point in planning and execution: to defeat the adversaries' military forces.

Before discussing the U.S. military's point of departure from Clausewitz's version, the next section discusses the shared aspects of helping to achieve military objectives, guiding practitioners in striking the enemy, facilitating the campaign planning process and providing a common doctrinal language among military practitioners.⁸³ The U.S. military's version of COG is more practical than abstract, specific instead of broad in definition, and requires interplay between two opposing forces to apply the construct.

The core purpose of COG is to help commanders effectively achieve their military objective of defeating the enemy. In *On War*, Clausewitz seeks to achieve this military objective and disarm the enemy in such a manner that this enemy submits to the will of the victor.⁸⁴ Defeating the enemy's system or structure remains the principal "aim of warfare" and the goal for which one arranges and concentrates forces.⁸⁵ U.S. military doctrine supports this argument: "Military objectives are those objects which—by their nature, location, purpose, or use—effectively contribute to military action and whose total or partial destruction, capture, or neutralization, in the circumstances ruling at the time, offers a definite military advantage."⁸⁶

⁸³ADRP 3-0, 4-2.

⁸⁴Clausewitz, 75-77.

⁸⁵Ibid., 77.

⁸⁶ADRP 3-0, 1-13.

Both versions also share the same purpose—guiding military practitioners in determining how to best identify and strike the enemy’s COG. Clausewitz takes great interest in the strategic judgment, intellectual genius, and critical analysis needed to defeat the enemy.⁸⁷ He believes that striking the enemy’s COG is simple in theory, but its application proves a challenge for many practitioners.⁸⁸ U.S. military doctrine reflects the wisdom gathered from the history of conflicts about how best to strike the enemy’s COG. The reason, from the U.S. military doctrinal perspective, is that “the loss of a center of gravity can ultimately result in defeat.”⁸⁹

COG remains a planning tool that facilitates the campaign planning process. Modern U.S. military doctrine and Clausewitz both articulate that the object of campaign planning is to design a plan that leads to the total defeat of the enemy. From Clausewitz’s point of view, COG guides the practitioner in the most important task of planning: identifying enemy COGs and tracing them back to the fewest sources possible.⁹⁰ He also states that the planning should lead to quick and decisive strikes against the enemy’s COG.⁹¹ The purpose is “that there must be an effort to make sure the main operation has precedence.”⁹² In U.S. military doctrine, the concept guides practitioners in COG analysis. JP 5-0 and ADRP 3-0 describe the COG construct as an analytical tool of the operational planner for designing effective campaign plans. JP 5-0 also emphasizes

⁸⁷Clausewitz, 489.

⁸⁸Ibid., 146.

⁸⁹ADRP 3-0, 4-4.

⁹⁰Clausewitz, 617.

⁹¹Ibid.

⁹²Ibid., 624.

identifying and analyzing friendly and adversary sources of strength as well as weaknesses and vulnerabilities.⁹³

COG also establishes a common doctrinal language among military practitioners.⁹⁴ Defining key concepts, such as COG, ensures that operational planners and commanders speak a common doctrinal language. *On War* and U.S. military doctrine sufficiently define COG. This allows planners and operators across the military community to describe, understand, discuss, and plan military activities that seek the destruction of the enemy.

Today, COG in U.S. doctrine differs from Clausewitz's original version. While Section 4 analyzes the many factors that influence this change, the next section highlights four major differences between modern U.S. doctrine and Clausewitz in their use and application of COG.

The U.S. military uses COG as an analytical construct rather than a figure of speech. U.S. doctrine operationalizes Clausewitz's version of COG into a practical and simplified analytical process. Military concepts that are concrete and practical serve a specific purpose in U.S. military doctrine: to assist planners in understanding the environment, framing the problem, or analyzing objects of interest.⁹⁵ The U.S. military's version of COG is adapted and becomes more useful as a practical model, rather than just a figurative expression or abstract mental model, for analysis and planning purposes.

In contrast, a mental model best describes Clausewitz's COG concept because it helps military practitioners to conceptualize the complex and interdependent relationships that comprise the enemy COG while designing effective plans to strike the enemy. Clausewitz's concept

⁹³JP 5-0, III-23.

⁹⁴ADRP 3-0, 4-2. Doctrine is "the concise expression of how Army forces contribute to unified action in campaigns, major operations, battles, and engagements. . . . Army doctrine provides a common language and a common understanding of how Army forces conduct operations."

⁹⁵JP 5-0, III-14.

provides a frame of reference to guide the commander's judgment regarding the internal structure of the enemy, enabling the commander to carry out the necessary tactical actions according to his standard operating procedures (SOP).

Clausewitz uses COG as a figurative expression to illustrate the causes, relationships, and functionality of COGs in the greater context of war. To describe the interdependent nature and effects of COGs in the environment, Clausewitz uses figurative language such as "focal point," "cohesion of parts," and "active agents." These phrases emphasize the particular cohesiveness or unity within the enemy's structure that facilitates the system in functioning as a single body; without cohesion, the concept is not useful. Clausewitz's COG also underlines the presence of an "active agent" or driver of action that provides direction and purpose for the entire enemy structure. These phrases guide the practitioner in identifying the correct COG and determining the desired effects to best destroy the enemy.

On the other hand, U.S. doctrine refers to COGs not as a "factor of balance" but as "sources of power," "capabilities," or "sources of strength." U.S. military doctrine identifies enemy COGs as superior combat power or as strengths that are active and mostly physical. The U.S. military defines COGs as "sources of power that provide moral or physical strength, freedom of action, or will to act."⁹⁶ From the Army perspective, a center of gravity is the "source of power" or "an enemy's main land combat power."⁹⁷ From a joint military perspective, a source of power refers to national instruments of power operating within the domains of land, sea, air, space, or cyber. This interpretation fits within the overarching doctrinal framework of ADRP 3-0 and JP 5-0, which is to "seek to throw enemy forces off balance, overwhelm their capabilities, disrupt their defenses, and ensure their defeat or destruction by synchronizing and applying all

⁹⁶ADRP 3-0, 4-3.

⁹⁷FM 3-0, 7-6.

elements of combat power.”⁹⁸ On the contrary, Clausewitz’s COG is a “factor of balance” or “a focal point,” and when struck with an overwhelming concentration of force, the enemy will fall defeated and rendered incapable of fighting.⁹⁹

Another difference is that both U.S. doctrine and Clausewitz give different qualifications relating to the use of COG. Put simply, the concept will not apply to every operating environment. In U.S. doctrine, the COG concept’s usefulness requires the existence of interplay between opposing forces. U.S. military doctrine states that “COGs exist in an adversarial context involving a clash of moral wills and/or physical strengths. They are formed out of the relationships between adversaries, and they do not exist in a strategic or operational vacuum.”¹⁰⁰ Unlike *On War*, U.S. military doctrine does not specifically mention whether COGs exist in an operational environment where adversarial forces lack cohesion or structural connectivity. COGs exist where opposing military forces, friendly and adversarial, have competing end-states and are attempting to achieve their respective military objectives. U.S. military doctrine focuses on the existence of a legitimate competitive entity in the operational environment and on determining how best to affect it. This does not discount environments where the adversarial force may be a non-military element, such as a natural disaster.

In contrast, Clausewitz’s COG concept takes it one step further and argues that in addition to interplay between opposing forces, the opponent’s COG must have a cohesive element. This means that his COG concept is relevant only to enemy systems that have structural connectivity, enabling the entire system to act as a single body and achieve its military end state.

⁹⁸ADRP 3-0, 2-9.

⁹⁹Clausewitz, 596.

¹⁰⁰JP 5-0, III-22.

Clausewitz's concept requires cohesion or interconnectedness within the enemy system.¹⁰¹ The intent of the concept is to help the practitioner identify the critical point within the enemy system that holds the entire structure together. In addition, in using the word "interconnected," Clausewitz understands that COGs have an interdependent nature. The concept focuses on delivering a decisive blow achieved only by striking "the hub of power and movement" or the largest massing of enemy troops.¹⁰² However, Clausewitz also acknowledges through observation that a single blow is unlikely to achieve a definite effect – total collapse of the enemy's armed forces. A commander, who applied COG, needs to use a series of successive strikes and apply them towards various points within the enemy's system.

In short, the U.S. military employs a different version than Clausewitz, the spirit of the concept remains unchanged: to defeat the enemy's forces and achieve one's military objective. Whether a commander chooses to physically mass his combat forces at a geographical point or mass the effects of the forces arrayed across the battlefield, the purpose must be to achieve a specific effect on the enemy system targeted. Clausewitz develops a mental model as a means to explain this process and uses analogies to generate understanding about the enemy. Modern U.S. military doctrine uses an analytical construct to facilitate the planning process and to identify and determine specified effects that the commander should seek when setting conditions for a decisive victory.

As it evolves, U.S. military doctrine continues to gain a better appreciation of Clausewitz's original concept. Since 2006, doctrine has adopted a more holistic understanding and application of COG. Subtle changes in doctrine, including the adoption of the Strange model, are helping the practitioner understand the enemy holistically. Additionally, the inclusion of

¹⁰¹Clausewitz, 485-486.

¹⁰²Ibid.

“design” language and tools demonstrates a shift in doctrine toward holistic analysis of COGs in the operating environment. These differences provide an understanding of why and how the U.S. version of COG deviates from Clausewitz’s original COG. The next section of this paper discusses the factors that led U.S. doctrine to diverge from Clausewitz’s point of view, discussing theories that best explain the changes in U.S. military doctrine and how it uses and defines COGs.

SECTION FOUR: ANALYSIS - THE FACTORS BEHIND THE DIFFERENCES

Five major factors provide insight on why the COG concept in U.S. doctrine differs from Clausewitz’s original version. Those factors are linguistic challenges, the evolution of the modern American way of war, a need for clarity through specification, a preference for analytical simplicity, and finally, the natural evolution of ideas.

Factor 1: Linguistic Challenges

The most significant factor causing differences between Clausewitz’s version and the U.S. military’s version relates to translation issues. There are multiple translated copies of Clausewitz’s book, *On War*. However, this section focuses on two often referenced versions to understand why the U.S. military’s version of COG refers to “sources of strength” rather than “focal points.” These are the 1872 German version, *Vom Kriege*, and the 1989 English version of *On War*, edited and translated by Michael Howard and Peter Paret. The modern U.S. military doctrine’s version of the COG concept uses the Howard and Paret translation of *On War* that uses the definition: “the hub of all power and movement” This is a loose translation of the German word *Zentrum*, which is closer in meaning to the English phrase “a focal point” rather than the “hub.” Also, Dr. Strange in *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So We Can All Speak the Same Language* argues that Clausewitz’s

intends for COG to mean “sources of strength, power, and resistance.”¹⁰³ The U.S. military’s description of COG is similar to Strange’s perspective. Some say the Howard and Paret version is the source of misinterpretation issues and why COG has a different meaning today.¹⁰⁴ Others, like Echevarria and Eikmeier, assert that in addition to the multiple translated copies of *On War*, Clausewitz’s use of COG as a figurative expression further complicates its translation from 19th century German into modern American English. For example, Eikmeier writes in his article, “Modernizing the Center of Gravity Concept—So It Works,” the COG concept was susceptible to misconceptions due to mistranslation from one language to another, uprooting an 19th century term outside of its original socio-political context, and simply understanding a 200-year old context and usage.¹⁰⁵

Factor 2: Changes in the American Way of War

The modern environment influences changes in the American way of war and alters how the U.S military strategizes to identify and attack current and future adversarial COGs, conducts war, and employs its forces. The changing operating environment influences the American way of warfare in the modern era. The modern adversary’s adaptation within a dynamic socio-political environment leads to changes in the operating environment, affecting how the U.S. military

¹⁰³Dr. Strange has had significant influence on modern U.S. military doctrine, which uses the Strange model in lieu of the COG analysis process. Strange and Iron, “Understanding Centers of Gravity and Critical Vulnerabilities, Part 2,” 12.

¹⁰⁴Echevarria and COL Eikmeier write that the multiple translations of *On War* is a factor for interpretative challenges. These authors provide great detail in the following publications: Echevarria, *Clausewitz’s Center of Gravity Changing Our Warfighting Doctrine - Again!*; and Dale Eikmeier, “Modernizing the Center of Gravity Concept - So It Works,” in *Addressing the Fog of COG: Perspectives on the Center of Gravity in US Military Doctrine*, ed. Celestino Perez (Fort Leavenworth, KS: Combat Studies Institute Press, 2012), 136-137.

¹⁰⁵ Dale Eikmeier, “Modernizing the Center of Gravity Concept - So It Works,” in *Addressing the Fog of COG: Perspectives on the Center of Gravity in US Military Doctrine*, ed. Celestino Perez (Fort Leavenworth, KS: Combat Studies Institute Press, 2012), 135-137.

responds in conducting war and employing force. These elements of change impact how COG evolves in the modern era and how it continues to deviate from Clausewitz's version.

The socio-political environment largely shapes modern U.S. strategy on how it conducts war and employs its forces. Since the 2003 Iraq War, the U.S. military articulates through doctrine how to achieve victory through decisive campaigns rather than a decisive battle. The early years of the Iraq War prove that only successive and sustained blows will defeat the enemy. In the 2010 article "The Issue of Attrition," J. Boone Bartholomees, Jr. writes that "the hope of winning a long-lasting victory in one smashing blow is generally illusory."¹⁰⁶

The U.S. has shifted between strategies of annihilation, attrition, and exhaustion, all with the intent to destroy the enemy and achieve a decisive victory. The destruction of the enemy's material and moral forces, the underlying purpose of applying COG, remains a decisive factor in modern U.S. strategy.¹⁰⁷ According to Bartholomees' analysis, the strategy of physical annihilation is most prevalent between Clausewitz's era and World War II. Military commanders' focus is on a quick and decisive victory and emphasizes the physical component of war. This strategy postulates that "a single event or a short series of directly related events can produce a victory."¹⁰⁸ This model uses the total war concept. Clausewitz writes: the political aim centers on the complete destruction of the enemy's forces. "Annihilation produces victory by eliminating the enemy's capability to defend."¹⁰⁹ From the 1990s to the early 2000s, the U.S. adapted the annihilation strategy focusing on the moral component of war. This new type of annihilation strategy, coined "Shock and Awe," intended to psychologically disarm and incapacitate the

¹⁰⁶J. Boone Bartholomees, Jr., "The Issue of Attrition," *Parameters* 40, no. 1 (Spring 2010): 17.

¹⁰⁷*Ibid.*, 5.

¹⁰⁸Bartholomees, 6.

¹⁰⁹*Ibid.*

enemy, removing all possible means to continue fighting.¹¹⁰ As the enemy adapts to the strategic air bombing campaigns of the Shock and Awe strategy, the enemy disperses and adopts guerilla-type camouflage techniques, blending with the population and minimizing opportunities to engage with more technically advanced forces. Bartholomees writes that “the annihilation strategy proved ineffective against competent non-state actors who conceal themselves within the population making them elusive targets for engagements.”¹¹¹ The U.S. military adapted and institutes an attrition strategy also employed in the Iraq and Afghanistan wars. Bartholomees describes the physical attrition strategy as an attempt “to win by destroying the enemy’s military forces over time in a series of perhaps unrelated battles and campaigns.”¹¹² This strategy emphasizes a subtle point about COGs: successive strikes are required to effectively neutralize, defeat, or degrade into an ineffective state and surrenders. As military strategies respond to changes in the operational environment, the U.S. military changes the way it conducts war and employs its forces to strike and destroy the enemy’s “sources of strengths” or capabilities.

In recent years, modern U.S. military doctrine has modified how it defines the principle of mass, which helps commanders employ their forces to achieve their objectives.¹¹³ The principle of mass relates to COG, in that the purpose is to concentrate the totality of combat forces (or the effects of combat power) to strike the enemy’s COG. JP 3-0 defines the principle as

¹¹⁰Ibid., 8.

¹¹¹Ibid., 16.

¹¹²Ibid., 10.

¹¹³JP 3-0, A-2.

the ability to mass the effects of one's combat power, such as combatant forces, which do not have to be geographically co-located.¹¹⁴ Dr. Milan Vego argues that:

[t]he physical concentration of one's combat forces was predominantly used in the past in both land and naval warfare. However, the currently evolving theory and practice of concentration of ground forces puts far more emphasis on one's ability, not necessarily to physically concentrate combat forces, but to create overwhelming effects at the decisive place and time.¹¹⁵

This is different from Clausewitz, who believes in the utmost concentration of forces [physically massing one's combat forces] at a single point and time on the battlefield to deliver a single blow to the enemy's position.¹¹⁶ Although, the aim is the same, striking the enemy's COG in current U.S. military doctrine is different from striking the enemy in Napoleon's era. Clausewitz and U.S. military doctrine remain in agreement that focusing efforts to strike the enemy's principal strength is the most straightforward approach to strategic victory. Furthermore, the U.S. military method in applying and executing the COG concept predominately focuses on indirectly targeting an opponent's system, whose center of gravity may be inaccessible to direct targeting means. This leads to focusing efforts on identifying and targeting critical capabilities linked to the COG. Since the latter years in the Afghanistan and Iraq theaters, U.S. military commanders have begun to combine effects-centric and capabilities-centric strategies with the intent to achieve a more definite effect on the enemy. When applying the attrition strategy, the U.S. military focuses on striking certain enemy capabilities to erode its ability to fight over time.

¹¹⁴Joint doctrine states, "Massing effects of combat power, rather than concentrating forces, can enable even numerically inferior forces to produce decisive results and minimize human losses and waste of resources." JP 3-0, A-2.

¹¹⁵Vego, VII-6.

¹¹⁶Clausewitz, 204.

U.S. military commanders seek to strike the COG primarily using indirect approaches and mass the effects of his forces to overwhelm and stun the enemy.¹¹⁷

Factor 3: A Need for Clarity through Specification

The definition of the COG in modern U.S. military doctrine has gone through many revisions over the years. Since 1986, the COG definition has evolved from a broad and general meaning to a more specific meaning. A clear definition is needed that will be explicitly simple for understanding and that allows for valid inferences. The U.S. military tries to maintain a balance in how far it adjusts the original meaning of COGs while retaining some semblance of its Clausewitzian roots. However, in seeking a clearer definition, each revision tends to confuse operational planners in their understanding and application of COGs.¹¹⁸ To illustrate, the 1986 version of FM 100-5, *Operations*, provides a broad definition of COGs: “that characteristic, capability, or locality from which the force derives its freedom of action, physical strength, or will to fight.”¹¹⁹ This manual expands its definition of COG, yet it still remains too vague:

The center of gravity may well be a component of the field force -- the mass of the enemy force, the boundary between two of its major combat formations, a vital command and control center, or perhaps its logistical base or lines of communication ... But an operational center of gravity may also be more abstract the cohesion among allied forces, for example, or the mental and psychological balance of a key commander.¹²⁰

Today, COG has evolved to have a more specific meaning, though issues of clarity still exist. Other reasons for this include, as discussed above, links to language challenges and the U.S. military’s misinterpretation of Clausewitz’s original text. Also, doctrine must remain adaptive and able to change its key concepts and definitions in the clearest way possible. Admiral Michael

¹¹⁷JP 3-0, A-2.

¹¹⁸Eikmeier, 139.

¹¹⁹FM 100-5 (1986), 179.

¹²⁰Ibid.

Mullen in JP 5-0 (2011) writes that “As our military continues to serve and protect our Nation in complex conflicts across the globe, it is appropriate that we continue to refine our doctrine and update our planning practices based upon experience and hard won knowledge.”¹²¹

The current doctrine’s version of COG is not as broad and muddled as the FM 100-5 (1986) version. COG, as defined in both ADRP 3-0 (2012) and JP 5-0 (2011), has become more specific and therefore clearer to the planner who will employ COG during the campaign planning process. Though the definition’s clarity has improved with each change, it still invokes confusion. COL (R) Dale Eikmeier, Dr. Autulio Echevarria, Dr. Joseph Strange, and Dr. Milan Vego, contemporary military theorists, all believe the current definition lacks clarity and confuses the operational planner.¹²² They all define COGs as “sources of power that provides moral or physical strength, freedom of action, or will to act.”¹²³ Today, the purpose and intent is clearer; however, the definition still remains problematic – “sources of power” still leans itself to various interpretation by the operational planner.

Over the years, doctrinal changes relating to COG stem from the continuous demand in the military field for a clearer definition, purpose, and intent. In the past, the U.S. military has revised the concept’s definition, refining the concept from its broadest terms to something more specific. The process of change towards a clearer and more precise meaning for COGs will continue into the future, as demands of the operating environment the military community dictate.

Factor 4: A Preference for Simplicity

U.S. military doctrine is historically a resource that makes complex concepts accessible to the widest possible target audience, which means it must be simple enough for the force to

¹²¹JP 5-0, preface.

¹²²See Dale Eikmeier’s article which discusses modernizing the current COG definition.

¹²³FM 3-0, 7-6.

grasp and utilize. The U.S. military's COG construct, the Strange model, illustrates this point. The force at large must understand military concepts so that it becomes a common doctrinal language between military practitioners.¹²⁴ In theory, simplifying complex concepts facilitates easier application, comprehension, and memorization.¹²⁵ Reductionism refers to breaking down large complex problems into simpler parts for better understanding. Reductionist analysis is a common technique in developing theories, defining concepts, and testing frameworks.¹²⁶ Alan Beyerchen in "Clausewitz, Nonlinearity and the Unpredictability of War" argues that U.S. military thought and analysis is more linear in execution, not just decomposing large complex and abstract ideas into its simpler parts but also isolating aspects of a problem to simplify the analysis process.¹²⁷ This dilemma is recognized in doctrine and the reader is told that the COG is "not an isolated concept," suggesting it [COG] cannot exist outside the adversarial context and that it is only relevant in relation to an enemy.¹²⁸ Beyerchen discusses how COGs are interconnected and analysts must consider the relationship between their parts. COG analysis requires that planners

¹²⁴ADRP 3-0, 4-2.

¹²⁵Beyerchen, 89.

¹²⁶Reductionism: "can either mean (a) an approach to understanding the nature of complex things by reducing them to the interactions of their parts, or to simpler or more fundamental things or (b) a philosophical position that a complex system is nothing but the sum of its parts, and that an account of it can be reduced to accounts of individual constituents. This can be said of objects, phenomena, explanations, theories, and meanings." Princeton School of Engineering and Applied Science, "Reductionism," Princeton University, www.princeton.edu/~achaney/tmve/wiki100k/docs/Reductionism.html. (accessed 31 October 2013).

¹²⁷Beyerchen, 81-85.

¹²⁸JP 5-0, III-22.

retain a holistic perspective of COG, the operational environment, and the enemy.¹²⁹ Beyerchen notes that, “Clausewitz has a profound sense of how our understanding of phenomena around us is truncated by the bounds we place on them for our analytical convenience.”¹³⁰ Clausewitz cautions that COGs are even complex in their simplest form and traditional analysis may inadvertently overlook the effects of chance and friction.

The simplicity factor drives change in doctrine because of the demand for easier understanding and application of the COG concept. The Strange model considers the importance of holistic analysis while providing a simple framework to guide the analytical process for friendly and enemy COGs.

Simplicity is attractive, especially in the complex and dynamic environment. The military community-at large believes Clausewitz’s version of the COG concept is too abstract, cumbersome, and complex to understand. Beyerchen describes how military practitioners prefer the simpler and more straightforward Jominian approach.¹³¹ Demand in the field results in immediate revisions in doctrine, simplifying the definition and introducing a simpler approach to applying COG. Though Eikmeier, Vego, and Echevarria offer compelling frameworks, U.S. military doctrine adopts the Strange model and redefines COGs.¹³² The Strange model provides a suitable framework, as it is practical and simple to use, and it helps planners understand COGs.

¹²⁹Beyerchen addresses Clausewitz’s acknowledgement regarding critical analysis and proof that traditional analysis based on the reductionist model. Beyerchen writes, “But his concerns, like those of many scientists wrestling with nonlinear phenomena today, are open systems which cannot be isolated from their environments even in theory, which are characterized by numerous levels of feedback effects, and which need to be grasped realistically as an interactive whole. Traditional analysis that aimed at breaking the system into simpler parts fails now just as surely as it did in Clausewitz’s time, and for the same reasons;” Beyerchen, 82.

¹³⁰Beyerchen, 81.

¹³¹*Ibid.*, 85.

¹³²Eikmeier, 162-163.

Dr. Strange states that the purpose is to simplify the process and allow planners to improve the distribution of their planning efforts.¹³³

Factor 5: Theories on the Evolution of Ideas

The competition of ideas on the U.S. military's COG concept contributes to its evolutionary change. Kuhn's theory on the revolution of scientific ideas may offer a plausible reason for the U.S. military's COG concept changing over the years. Kuhn argues that new ideas or concepts eventually replace old ones. Kuhn's theory accounts for the change in a set of knowledge over time. Periods of gradual accumulation, Kuhn stated, "...are punctuated by violent intellectual revolutions and episodes of intense controversy in which an existing paradigm is found to be no longer adequate and is replaced by a new one."¹³⁴ Kuhn's argument categorizes the COG concept's change as revolutionary, not evolutionary. In analyzing past U.S. doctrine from 1996 to present, Kuhn's theory is inadequate in explaining the driving factor behind the changes to the COG concept. As demonstrated in Section 3, each revision to the COG's definition reflects a gradual accumulation of knowledge absent an abrupt shift in terminology or ideas.

In *The Scientific Way of Warfare*, Antoine Bousquet provides a different point of view than Kuhn's theory. His argument is that the evolution of ideas drives an accumulation of ideas rather than revolutionary or abrupt shifts. Bousquet states that "[t]heories and concepts are subject to an accumulation of experiments, publications, and debates and only gain broad currency through their review by the scientific or military community."¹³⁵ Bousquet claims that scientific progression is not based simply on the progression of ideas but also on the social-scientific

¹³³Strange and Iron, "Understanding Centers of Gravity and Critical Vulnerabilities, Part 2."

¹³⁴Thomas S. Kuhn, *The Structures of Scientific Revolutions*, 3rd edition (Chicago, IL:University of Chicago Press, 1996).

¹³⁵Bousquet, 21-22.

orientation or discourse within a community. The competition of ideas establishes sub-communities within the larger community. His theory also references the clash of ideas and theories among these sub-communities, which are ultimately at odds. This also applies to the U.S. military community, particularly the different camps of military thought regarding COGs. There are three sub-communities: traditionalist, modernist, and integrationist.¹³⁶ The traditionalist group defines COG in terms of its classical military definition, as used in Clausewitz's *On War*. The 1986 and 1993 versions of FM 100-5 use a definition that reflects this traditional sense.

Later revision reveals that doctrine adopts an integrationist perspective in defining COG. The definitions and uses of the concept in the 2001 and 2003 versions of FM 3-0 still rely on Clausewitz's version, but they begin to adjust how the U.S. military will apply the concept. The U.S. military adopted the moral annihilation strategy (e.g., Shock and Awe) and adapted its use of the principle of mass, in which U.S. forces mass effects rather than forces to destroy certain enemy capabilities. Current doctrine best represents the integrationist approach, as the 2012 version has yet to fully adopt a truly modernist version of the concept, which will imply a complete doctrinal break from Clausewitz's version of the concept. Dr. Eikmeier, a modernist, supports this approach to make the COG concept truly reflective of the U.S. way of war.¹³⁷ Modern doctrine and the changes to COG reflect Bousquet's theory in that the changes reflect the ideas of competing sub-communities within the military community. Subsequent changes in doctrine take place as new ideas replace old ones.

This section has analyzed and identified five factors that lead to doctrinal revisions of the COG concept: linguistic challenges, the evolution of the modern American way of war, a need for a clear definition and concept, a preference for analytical simplicity, and finally, the evolution of

¹³⁶Evans, 89-93.

¹³⁷Eikmeier, 134.

ideas best supported by Bousquet's theory. Military concepts require clarity and purpose for understanding and proper application. External factors, such as technology and changes affect the conduct of wars and influence how the military interprets and applies military concepts on the battlefield. As the U.S. continues to develop its own operational art and way of warfare, adjusting to the pace and change of the operating environment and the enemies it fights, its version of COG has diverged from Clausewitz's intent. This leads to the paper's conclusion that the U.S. version of the COG concept reflects the modern operating environment. To keep doctrine relevant, the U.S. military revises its COG definition, and implements both traditionalist and integrationist ideas in an effort to facilitate easier application of a classical concept that still has tremendous value.

CONCLUSION

This paper concludes that the U.S. military's version of the COG concept and its definition have changed by becoming more specific and less abstract over a span of iterative revisions. This study focuses on Clausewitz's description of COG in *On War* and in modern U.S. military doctrine. According to Clausewitz, COG facilitates the employment of force to achieve a specific effect: the destruction of the enemy's forces. Clausewitz defines COG as "the hub of all power and movement, on which everything depends. That is the point which all our energies should be directed."¹³⁸ His definition illustrates three important aspects of COGs: what they are, where and when they exist, and how they behave. COG, as defined by Clausewitz, illustrates how the enemy's military power functions as a "focal point." Clausewitz believes that physically massing combat forces at the decisive point generates the most effective blow against the enemy. Clausewitz uses analogies (or figurative expressions) to illustrate abstract ideas as clearly as

¹³⁸Clausewitz, 595-596.

possible. These analogies help the practitioner conceptualize how COGs function in the context of war and apply in the design of campaign plans to destroy the opponent's armed forces.

U.S. military doctrine uses the COG concept to facilitate the employment of force to destroy the enemy's combat power. The U.S. doctrinal definition of COG places considerable emphasis on the physical strengths and capabilities of friendly and enemy military forces. Joint and Army doctrine define COG as "sources of power that provide moral or physical strength, freedom of action, or will to act."¹³⁹ COG facilitates massing the effects of combat power to defeat the enemy and to strike the "sources of strength" that enable it to achieve its military objective. Modern U.S. military doctrine promotes its version of COG as a practical analytical model (e.g., the Strange model). Finally, COG is a planning tool used to frame the operational environment and provide a basis for an operational approach, facilitating the design of an effective military strategy against the enemy's COG.

The analysis shows that U.S. military doctrine's adoption of practical concepts designed for specific purposes transitions COG away from its Clausewitzian beginnings. Similarities between Clausewitz and modern U.S. doctrine include associating the COG concept with facilitating the means to achieve military objectives, identifying and striking the opponent's forces, designing the campaign plans, and providing a common doctrinal language or framework to use among military practitioners. The analysis section, Section 4, also outlines how in U.S. doctrine COG requires an adversarial environment to exist, whereas, Clausewitz takes it one step further, believing that COGs must first have a cohesive element and act as a single body before his concept can be applied.

This study ultimately identifies five major factors that influence the changes between the version in U.S. doctrine and Clausewitz's original version. These include linguistic challenges,

¹³⁹JP 5-0, III-22.

the evolution of the modern American way of war, a need for clarity through specification, a preference for analytical simplicity, and finally, the natural evolution of ideas. Military concepts naturally require a degree of understanding, clarity, and purpose for those who use them. There are also external factors, like technology and change to the conduct of war that also influence how planners interpret and apply military on the battlefield. As the U.S. has refined its own operational art and way of warfare, adjusting to the pace and change of the operating environment and the enemies it fought, U.S. military doctrine follows a path that diverges from Clausewitz's original version of COG.

The implication of this research for operational planners is that the U.S. COG concept and its definition are becoming more narrow over time, therefore, limiting its use and applicable across a variety of future operating environments. Clausewitz's abstract COG concept facilitates its resiliency across the ranges of war, space, and time. It also gives commanders greater latitude in the interpretation, description, and application of COGs. Using Clausewitz's COG as a point of departure, the U.S. military adapts its version of the COG concept into a more specific and applicable construct that best reflects the way the U.S. military currently fights. Where Clausewitz appreciates the value in generalities over specifics, U.S. doctrine has taken a more specific approach in defining the concept.

Also, the rate of change in the current and future operating environments will consequentially lead to more doctrinal changes and continual modernizing of the COG concept. Simplicity, conciseness, and objectivity are beneficial for the operational planner because they facilitate easier understanding and application of the concept. However, there must be a balance between becoming too specific or too broad. This study confirms that military concepts not only depend on their contemporary environment, but that several other factors also influence change. It also confirms the need for and relevance of the COG concept and the likelihood that it will remain a central part of U.S. operational art and military strategy.

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